Curriculum Vitae for Michael L. Black

NOAA/OAR/AOML
Hurricane Research Division
4301 Rickenbacker Causeway
Miami, Florida 33149, USA
Ph: 305-361-4371
Email: Michael.Black@noaa.gov
URL: www.aoml.nooa.gov/hrd

Position description:
MICHAEL L. BLACK is a research meteorologist with the Hurricane Research Division (HRD) of AOML[1], NOAA[2] in Miami, Florida. He has been with HRD since April 1985. Mr. Black's current research involves the use of airborne radar data and Global Positioning Satellite (GPS) dropwindsondes, which are deployed in and around tropical cyclones from the NOAA P-3 and G-IV research aircraft. He analyzes data from these dropsondes, which are greatly improving the hurricane track forecasts and provide unprecedented detail of the wind, temperature, and moisture structure of the inner core region of tropical cyclones. He is also actively involved with HRD's annual field program where he designs flight experiments and serves as a lead project scientist, dropsonde scientist, or radar scientist on hurricane research missions with the NOAA aircraft. Mr. Black has flown into the eye of over 50 hurricanes over the last 27 years. In addition to his work with the GPS dropsondes, Mr. Black works extensively with airborne Doppler radar data in efforts to help understand the physical mechanisms in the hurricane eyewall that contribute to intensity change. Mr. Black routinely gives scientific and public interest presentations on hurricane research developments at conferences and symposiums and has authored several papers dealing with hurricane structure and dynamics. In February 2010, Mr. Black was invited to join the newly formed science team for NOAA's Unmanned Aircraft Systems (UAS) program. During the summer of 2010 he worked on a joint NOAA-NASA[3] field campaign, serving as mission scientist for the maiden flight above Hurricane Earl with the NASA Global Hawk (GH) UAS. Mr. Black was co-Principle Investigator for NOAA's Winter Storm and Pacific Atmospheric Rivers (WISPAR) experiment with the GH and has been involved with the multi-year NASA/NOAA Hurricane and Severe Storm Sentinel (HS3) field campaign involving two NASA GH UAS aircraft. He pioneered the real-time processing, creation of data products, and data transmission of GPS dropsonde observations released from the GH aircraft. Recently, Mr. Black has been offered and accepted the role as co- Chief Scientist with NOAA's UAS program.

[1] Atlantic Oceanographic and Meteorological Laboratory
[2] National Oceanic and Atmospheric Administration
[3] National Aeronautics and Space Administration

Employment history:
April 1985- present: Research Meteorologist, Hurricane Research Division, NOAA/AOML

Education:
2000-2002: Enrolled in graduate-level classes at the University of Miami
1983-1984: 2 years graduate studies-research assistant, 1983-84, Atmospheric Science, University of Miami

1981-1982: 1 year graduate studies-teaching assistant, 1981-82, Atmospheric Science, Old Dominion University
1981: Bachelor of Science, May 1981, Physical Science with concentration in Meteorology, Old Dominion University, Norfolk, Virginia

Professional society memberships:
American Meteorological Society (member)
Steward, AOML Branch, National Weather Service Employees Organization
Vice-Chairman, Miami Meteorological Society, 5/89-12/91
Secretary-treasurer, Miami Meteorological Society, 5/88-5/89
Division Representative, Marine Science Graduate Student Organization, University of Miami, 9/83-9/84
Adjunct Faculty, Embry-Riddle Aeronautical University, 7/85-7/86
President, American Meteorological Society, Old Dominion University Chapter, 9/80-9/81

Committee memberships:
NOAA UAS Science Team
NEXRAD Tropical Cyclone Advisory Committee
USWRP Science Symposium Member

Awards:
2013 NASA HS3 Group Achievement Award NASA

2011 NASA GRIP Group Achievement Award NASA

May 2007: Department of Commerce Bronze Meda□l, (HRD group award): □□For innovation and commitment to the NOAA Hurricane Mission during Katrina's Louisiana landfall while recovering from the South Florida landfall.

2006 NASA TCSP Group Achievement Award NASA

May 2004: Banner Miller Award given by the American Meteorological Society at the 26th Conference on Hurricanes and Tropical Meteorology. The award recognizes an outstanding contribution to the science of hurricane and tropical weather forecasting published in a journal with international circulation over a 4-year period.

December 2003: Department of Commerce Gold Medal: For pioneering and innovative research using Global Positioning System (GPS) dropsonde data to study the wind structure in the eyewall region of tropical cyclones

April 2002: Outstanding Achievement in Meteorology given at the National Hurricane Conference

November 1992: Department of Commerce Gold Medal (Special act or service group award) for actions during and following Hurricane Andrew

Graduated Cum Laude, Old Dominion University

Recent Publications (Chronological):

Rogers, R.F., S.D. Aberson, A. Aksoy, B. Annane, **M. Black**, J.J. Cione, N. Dorst, J. Dunion, J.F. Gamache, S.B. Goldenberg, S.G. Gopalakrishnan, J. Kaplan, B.W. Klotz, S. Lorsolo, F.D. Marks, S.T. Murillo, M.D. Powell, P.D. Reasor, K.J. Sellwood, E.W. Uhlhorn, T. Vukicevic, J.A. Zhang, And X. Zhang, 2013: NOAA's Hurricane Intensity Forecasting Experiment (IFEX): A progress report. *Bulletin of the American Meteorological Society*, Volume 94, Issue 6, pp. 859-882.

Lowag, A., **M. L. Black**, and M. D. Eastin, 2008: External and Internal Influences on Structural and Intensity Changes of Hurricane Bret (1999). Part I: Atmospheric and Oceanic Influences, *Mon. Wea. Rev*., accepted.

J. Halverson, **M. Black**, S. Braun, D. Cecil, M. Goodman, A. Heymsfield, G. Heymsfield, R. Hood, T. Krishnamurti, G. McFarquhar, M. J. Mahoney, J. Molinari, R. Rogers, J. Turk, C. Velden, D.-L. Zhang, E. Zipser, and R. Kakar, 2007: "NASA's Tropical Cloud Systems and Processes Experiment", *Bulletin of the American Meteorological Society*, Volume 88, Issue 6 , pp. 867-882

Robert Rogers, Sim Aberson, **Michael Black**, Peter Black, Joe Cione, Peter Dodge, Jason Dunion, John Gamache, John Kaplan, Mark Powell, Nick Shay, Naomi Surgi, and Eric Uhlhorn, 2006: "The Intensity Forecasting Experiment: A NOAA Multiyear Field Program for Improving Tropical Cyclone Intensity Forecasts", *Bulletin of the American Meteorological Society*, Volume 87, Issue 11, pp. 1523-1537

Rogers, R., F., **M. L. Black**, S. S. Chen, and R. A. Black. 2006, "An Evaluation of Microphysics Fields from Mesoscale Model Simulations of Tropical Cyclones. Part I: Comparisons with Observations", *Journal of the Atmospheric Sciences*, Volume 64, Issue 6, pp. 1811-1834.

Aberson, S. D., **M. L. Black**, R. A. Black, R. W. Burpee, J. J. Cione, C. W. Landsea, and F. D. Marks Jr., 2006: Thirty years of tropical cyclone research with the NOAA P-3 aircraft. *Bull. Amer. Meteor. Soc.*, **87,** 1039-1055.

Aberson, S. D., M. T. Montgomery, M. Bell, and **M. Black**, 2006: Hurricane Isabel (2003): New insights into the physics of intense storms. Part II: Extreme wind speeds. *Bull. Amer. Meteor. Soc.*, **87,** 1349–1354.

Corbosiero, K. L., J. Molinari, A. Aiyyer, and **M. L. Black**, 2006: The Structure and Evolution of Hurricane Elena (1985) Part II: Convective Asymmetries and Evidence for Vortex Rossby Waves. *Mon. Wea. Rev.*, **134**, 3073-3091.

Montgomery, M. T., M. Bell, S. D. Aberson, and **M. Black**, 2006: Hurricane Isabelle (2003): New insights into the physics of intense storms. Part I: Mean vortex structure and maximum intensity estimate. *Bull. Amer. Meteor. Soc.*, **87,** 1335–1347.

Corbosiero, K. L., J. Molinari, and **M. L. Black**, 2005: The structure and evolution of Hurricane Elena (1985). Part I. Symmetric intensification. *Mon. Wea. Rev.*, **133**, 2905-2921.

Gedzelman, S., E. Hindman, X. Zhang, J. Lawrence, J.F. Gamache, **M.L. Black**, R.A. Black, J.P. Dunion, and H.E. Willoughby, 2003. Probing hurricanes with stable isotopes of rain and water vapor. *Monthly Weather Review,* 131(6):1112-1127.

Franklin, J. L., **M. L. Black**, and K. Valde, 2003: GPS dropwindsonde wind profiles in hurricanes and their operational implications. *Wea. Forecasting*, **18**, 32-44.

Black, M.L., J.F. Gamache, F.D. Marks, C.E. Samsury, and H.E. Willoughby, 2002: Eastern-Pacific Hurricanes Jimena of 1991 and Olivia of 1994: the effect of vertical shear on structure and intensity. *Mon. Wea. Rev*., **130**, 2291–2312.